

What is claimed is:

1. A metallic alloy for coating a metal surface comprising a deoxidizing element, wherein said deoxidizing element reduces a metal-oxide layer on said metal surface.

2. The metallic alloy of claim 1, wherein said deoxidizing element is a transition metal, selected from the group consisting of manganese, chromium, vanadium, titanium, zirconium, hafnium, niobium, tantalum, aluminum, lanthanide metals in combination with and oxygen seeking nonmetal/metalloid selected from the group consisting of silicon, carbon, boron, phosphorous, sulfur and combinations thereof.

3. The metallic alloy of claim 1 wherein said deoxidizing element is further characterized in that it does not chemically interact with said metallic alloy.

4. The metallic alloy of claim 1, wherein said metallic alloy base metal is selected from the group consisting of iron, nickel, cobalt, manganese, chromium, titanium, vanadium, zirconium, niobium, hafnium, tantalum, tungsten, and aluminum.

5. The metallic alloy of claim 1 wherein said deoxidizing element is present at a level of 5 to 70 %.

6. A method of forming a metallic coating on a metal surface comprising:
(a) providing a metallic coating alloy comprising a deoxidizing element;
(b) melting said metallic coating alloy to a liquid state;
(c) applying said liquid melt of said metallic coating alloy to said metal
5 surface.

7. The method of claim 6 wherein said step of melting said alloy to a liquid
state comprises forming a liquid state with no precipitates of said deoxidizing element
existing in said liquid state.

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8. The method of claim 6 wherein said deoxidizing elements are selected
from the group consisting of manganese, chromium, silicon, carbon, boron, and
combinations thereof.

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9. The method of forming a metallic coating according to claim 6, wherein
melting said metallic coating alloy and applying said liquid melt comprises thermal spray
coating said metallic coating alloy onto said metal surface.

10. A method of forming a metallic coating according to claim 9, wherein
20 thermal spray coating said metallic coating alloy comprises at least one of wire-arc
spraying, plasma spraying, flame spraying and high velocity oxyfuel spraying said
metallic coating alloy onto said metal surface.

11. A method of forming a metallic coating on a metal surface comprising:

- (a) providing a metallic coating alloy comprising a deoxidizing element;
- (b) melting said metallic coating alloy to a liquid state;
- (c) applying said liquid melt of said metallic coating alloy to said metal surface wherein said metal surface contains an oxidized surface layer;
- (d) reducing said oxidized surface layer; and
- (e) forming a metallurgical bond at said location where said oxidized surface layer has been reduced by said deoxidizing element.

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